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## ABSTRACT

This study examines the object case markings "o" and "ga" in Japanese with respect to the degree of predictability. A speaker who assumes that the listener will have difficulty identifying the referent, tends to use a construction type that enables the listener to uniquely identify the referent. This notion of predictability is investigated on two planes, referential predictability and thematic predictability, through three sets of experiments. One additional experiment is used to study the closely related concept of thematic importance, reflected by topic persistence of a referent in subsequent discourse. The subjects for the study were 25 native-Japanese-speaking students at the University of Oregon. Subjects were asked to choose either "ga" or "o" in the appropriate position in the text frames provided. The results of the first experiment indicate that there is no significant correlation between the use of "ga" and previous mention of the referents. The second and third experiments focused on thematic probability, and results indicated that "ga" is likely to mark a referent that is less predictable at a given moment in a sentence. The fourth experiment examined thematic importance, and results strongly supported the idea that "ga" is used with thematically important referents that persist longer in the subsequent discourse. English translations of the artificially constructed text frames are appended. (DJD)

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# PREDICTABILITY, IMPORTANCE, AND CASE MARKING IN JAPANESE

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This paper will attempt to examine the object case markings 'o' and 'ga' in Japanese, with respect to the "degree of predictability", defined by Givon (1983) as the "difficulty a speaker and hearer experience in identifying the referent". That is, a speaker who assumes that the hearer will have difficulty identifying the referent (i.e. topic), tends to use a construction type that enables the hearer to uniquely identify that referent. This notion of predictability is examined here on two planes, referential predictability and thematic predictability, through three sets of experiments. One additional experiment described here is used to study the closely related concept of "thematic importance", (Givon 1983), reflected by "topic persistence" of a referent in subsequent discourse. These two factors interact closely in the psychological aspect of a speaker's discourse understanding, and how that understanding is shaped through the use of case marking in Japanese.

## BACKGROUND OF THE STUDY

In Japanese, it has been traditionally assumed that 'ga' marks the subject of a sentence and 'o' marks the direct object as shown in (1).

- (1) Hanako-ga ringo-o/\*ga tabeta  
apple ate  
"Hanako ate an apple."

However, transitive adjectives that occur with two NPs, and verbs that denote low transitivity tend to have a split case marking on the object.<sup>1</sup> Some examples of these predicates are listed below in (2) and (3).

- (2) Taroo-ga susi-ga/o tabe-tai to itta  
eat-want COMP said  
"Taroo said he wanted to eat susi."  
(3) Hanako-ga sakana-ga/o tabera-reru  
fish eat -can  
"Hanako can eat fish."

The purpose of this paper is to attempt to associate the differential case markings of the object in Japanese with the two discourse measurements of 'predictability' and 'thematic importance'.<sup>2</sup> This study raises two important theoretical questions. First, how can predictability and importance be formalized

in the linguistically relevant framework of discourse structure. Second, how can such a formalization account for the meaning of a single proposition or a complex discourse structure.

### PREDICTABILITY

The following discussion, briefly illustrates two criteria to measure the predictability of information. They are referential predictability and thematic predictability. Referential predictability is represented at the surface structural level that pertains to the anaphoric relation between propositions. A study by Givon (1983) offers insight into this question. He introduced the following notions of 'referential distance' and 'potential interference' to measure the referential predictability of information.

Referential distance -- This measurement assesses the gap between the previous occurrence in the discourse of a referent and its current occurrence in a clause, where it is marked by a particular grammatical coding device. The gap is thus expressed in terms of number of clauses to the left. (p. 11)

Potential interference -- This measurement assesses the disruptive effect which other referents within the immediately preceding register may have on topic availability or identification within a clause. (p. 11)

What he claims is that the degree of predictability assessed in terms of these two measurements affects the speaker's grammatical coding device. For illustrative purposes, consider the following example.

- (4) I took the book off the shelf and put 'it' on the desk.

The interpretation of the referent in the second clause depends on that of the preceding clause. That is, 'it' in the second clause refers back to the 'book' in the first clause. This anaphoric function of 'it' connects the two sentence, which enables a person to interpret the two clauses together as one coherent whole. Consider now the following context.

- (5) I was going to go to school. I took my coat from the closet and turned off all the lights. As I was leaving, Mr. Smith arrived and told me he had something important to discuss. I decided not to go to school and to listen to him. So I put 'it' back in the closet.

It is by no means difficult to interpret what the 'it' in (4) refers to, while in (5) it may be difficult to identify the antecedent of 'it', the noun phrase, 'the coat'. It may then be assumed that the more difficult it is for a hearer to identify the referent, the more salient the coding material that is required by the speaker to maintain the referent. Thus, a speaker is likely to use the noun phrase, 'the coat'

instead of the pronoun 'it' in context (5). This study explores the assumption that the case marking 'ga' is used to mark the less predictable referent.

A basic assumption behind the notion of thematic predictability lies in what a number of scholars have identified as the 'frame' or 'script'. Minsky(1980), for example, identifies frames with "a person's general knowledge of familiar actions or objects", indicating that "a frame is a data-structure for representing a stereotyped situation, like being in a certain type of living room or going to a birthday party" (p.1). The notion of a frame thus encodes a person's expectations about a relationship among elements in a sentence. The prototypical elements in a commercial event frame, for example, are 'buyer', 'seller', 'money', and 'goods'. They may be diagrammed in the following manner.

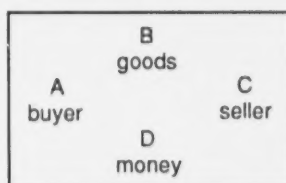
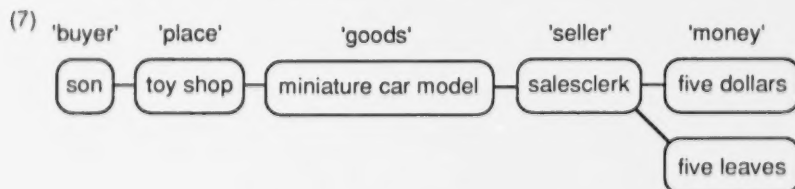


Figure 1. Commercial event frame

What concerns us here is the ordering of these elements. Nothing in Figure 1 indicates a linear hierarchical organization of the elements. It represents a scene schema rather than how it is to be presented in a discourse. To illustrate, let us consider the following commercial event text.

(6) I had an embarrassing experience with my five-year-old son in the toy shop we went to yesterday. He wanted to buy a miniature car model. He picked up one of the cars, took it to a salesclerk, and asked her to wrap it. The salesclerk asked for five dollars. He put his hand into his pocket and gave her five leaves that he had picked up from our garden that morning.

We assume that the text in which sets of the propositions are cited is processed sequentially, i.e., in the order in which they appear in a sentence. In this manner, the processing operation is a procedural model that establishes 'network relations' among the elements in a given discourse. This network may be considered a conceptual link, as illustrated in (7).



What seems important is that the occurrence of each node in the network provides a particular conceptual framework that helps a hearer to predict what is coming next. The specific mention in the second node of 'toy shop' gives hearers a certain framework, which restricts the possible occurrences in the following node. The further the hearer progresses through the nodes, the possible occurrences of an entity become more restricted, thus more predictable. However, most discourse contexts will not always be predictable in this way. For example, in context (6) hearers would expect the son to exchange money for the car. But he gave 'leaves' instead of money, which violates the hearers' expectation. This observation may indicate that thematic predictability pertains to a person's knowledge source, namely the semantic knowledge associated with words and background knowledge. These forms the basis for the construction of the 'frames' or 'scripts' necessary to understand a discourse..

#### THEMATIC IMPORTANCE

The predictability measurements outlined above involve preceding discourse context. Thematic importance, another measurement presented in the present study, is reflected by 'topic persistence' of the referent in subsequent discourse. Givon (1983) provides the following hypothesis concerning 'topic persistence': "More important discourse topics appear more frequently in the register, i.e., they have a higher probability of persisting longer in the register after a relevant measuring point" (p.15). This study explores the assumption that the referent persisting longer in the subsequent context will be more likely to be marked with 'ga' as opposed to 'o'.

The notions of 'predictability' and 'importance' discussed above reflect a concern with the role of 'attention' paid in a given universe of discourse. In other words, when a speaker assumes that a hearer has difficulty in identifying the referent, or when a speaker introduces an important topic into the discourse, the speaker tends to use a perceptually more salient construction type to indicate that special attention should be given to that topic. We attempt to show that the use of 'ga' serves to mark less predictable and more important referents, and enables a hearer to highlight these referents.

#### METHODOLOGY

The present study is based on sets of experiments conducted with 25 native subjects. Six were students of the American English Institute on the University of Oregon campus; four were graduates and fifteen were undergraduate students at the university. The text frames used in the experiments were artificially constructed in order to provide as much context as possible for the 'ga' in the object. It is assumed that the use of invented texts will lead to the most accurate results because they have been artificially purified of all irrelevant features in order to investigate as precisely as possible what is to be examined. A general problem associated with the use of such text frames is that the subjects tend to read them too quickly, and often achieve less than perfect comprehension. This

contrasts with natural communication, in which the participants are better motivated. In order to encourage the subjects to consciously read the texts as constructed and ensure real comprehension of the text frames, the subjects were given a comprehension task at the end of each experiment. Subjects were first asked to read the texts and later to place either the case marking, 'o' or 'ga' in the indicated positions. The texts from all experiments appear in the appendix and are referred to as (8) - (18).

#### EXPERIMENT 1. REFERENTIAL PREDICTABILITY

Experiment I examines the relationship between case marking and the two discourse factors, referential distance and potential interference. When examining referential distance, we assume that the wider the gap between two mentions, the more difficult it is for hearers to identify the referent, and thus it is more likely to be marked with 'ga'. When assessing potential interference, we assume that presence of another referent with equal topic availability within the immediately preceding clause may cause difficulty in identifying the referent.

After reading the texts, the subjects were asked to choose either 'ga' or 'o' for a test word contained in a sentence at the end of each text. Case markings were omitted from test words. In text (8), a particular item was mentioned a few times, but a topic shift separated the mentions. In (9) a particular item was mentioned frequently without large gaps, and in (10) an interfering object appears with a test word of equal value in topic availability.

Table 1 displays results of a test that compared contexts (8) and (9), concerned with the frequency of mention. The result shows that no significant differences were observed when comparing context (8) with context (9). This shows that frequency of mention in Japanese does not trigger the choice of 'ga' instead of 'o'. Table 2 gives test results of two conditions: one contains no interfering referent in the immediately preceding context, the other contains an interfering referent in the preceding context. (Contexts (8) and (9), both of which contain no interfering objects, were collapsed together in Table 2.) These results show that the choice of case marking is significantly affected by the presence of interference from other topics.

TABLE 1. Correlation Between Frequency of Mention and Case Marking Usage

| Frequency of Mention | 'ga'     | 'o'      | Total |
|----------------------|----------|----------|-------|
| Low (8)              | 3 (12%)  | 22 (88%) | 25    |
| High (9)             | 6 (24 %) | 19 (76%) | 25    |

$$\chi^2 = 1.2, \quad df = 1, \quad p > 0.10$$

TABLE 2. Correlation Between the Presence of Interference and Case Marking Usage

| Interference            | 'ga'     | 'o'      | Total <sup>3</sup> |
|-------------------------|----------|----------|--------------------|
| Not present (8) and (9) | 9 (18%)  | 41 (82%) | 50                 |
| Present (10)            | 19 (76%) | 6 (24%)  | 25                 |

$$\chi^2 = 33.76, \quad df = 1, \quad p < 0.01$$

When we find in discourse, a potentially interfering referent, it breaks the coherence between the two mentions of a given referent. This requires a reader to search for a relevant referent and retrieve a referent no longer connected in sequential order. This supports the assumption that the presence of 'ga' functions to highlight those elements in a way that enables us to uniquely identify them.

#### EXPERIMENT II. THEMATIC PREDICTABILITY 1

This experiment examines thematic predictability by using a single proposition, which is the fundamental unit in discourse understanding. Four pairs of sentences were prepared. In each, the case markings of the object were omitted. All the sentences were designed so that the occurrence of the test words in the first sets (a) were more predictable, thus more coherent, than those in the second sets (b). The subjects were asked to place either 'ga' or 'o' in the expected position after reading each pair of sentences.

Table 3 displays the distribution of the case markings obtained from the subjects. Table 4 specifies the percentage of occurrence of the case markings on the object. The results indicates that the use of case markings were significantly different when comparing the first sets with the second sets. That is, the subjects were likely to place 'o' in the first set, but were more likely to place 'ga' in the second set of each pair.

TABLE 3. Distribution of the Case Marking in Each Sentence

|       | 'ga'     | 'o'      |       | ga'      | 'o'     |
|-------|----------|----------|-------|----------|---------|
| (11a) | 10 (40%) | 15 (60%) | (11b) | 18 (72%) | 7 (28%) |
| (12a) | 7 (28%)  | 18 (72%) | (12b) | 18 (72%) | 7 (28%) |
| (13a) | 11 (44%) | 14 (56%) | (13b) | 23 (92%) | 2 (8%)  |
| (14a) | 9 (36%)  | 16 (64%) | (14b) | 19 (76%) | 6 (24%) |

TABLE 4. Correlation Between Semantic Predictability and Case Marking

|         | % 'ga' | % 'o' |
|---------|--------|-------|
| 1st Set | 42     | 58    |
| 2nd Set | 78     | 22    |

$$\chi^2 = 34.39, \quad df = 1, \quad p < 0.01$$

A representation of predictability based on a single proposition, however, is established through one's general knowledge independent of its context.<sup>4</sup> A particular sentence cannot be treated as having a single propositional source; rather, the interpretation of a proposition depends upon knowledge of the contexts in which the previous sentences were produced. To confirm the hypothesis in the present study, the next section examines case variation using wider contexts.

#### EXPERIMENT III. THEMATIC PREDICTABILITY 2

Experiment III concerns the representation of the thematic predictability that basically involves two kinds of knowledge structure: specific knowledge available from the previous discourse context and general knowledge about the real world. The subjects were asked to read two hypothetical texts, which were roughly identical except for the test sentences (15) and (16).

(15) She wanted to read the birthday card.

(16) She wanted to read the textbook.

The texts are designed so that the first sentence serves to create a certain frame (birthday party frame), which restricts the interpretation of the rest of the context. Case markings on the test words ('birthday party' and textbook') were omitted to examine whether the subjects would choose the 'ga' or the 'o' for the test words.

TABLE 5. Correlation Between Thematic Predictability and Case Marking

|      | 'ga'     | 'o'      | Total |
|------|----------|----------|-------|
| (15) | 4 (16%)  | 21 (84%) | 25    |
| (16) | 17 (68%) | 8 (32%)  | 25    |

$$\chi^2 = 13.875, \quad df = 1, \quad p < 0.01$$

Table 5 displays the test results for each context. The statistical figures show significant case marking differences. This difference between the two contexts involves the expectations that subjects obtained from the discourse context and from their real world background knowledge by the time they have

reached the test words. That is, 'birthday card' in sentence (15) normally fits into a person's birthday party frame. Whenever he talks about 'having a birthday party', he expects the item to be present. 'Textbook', as used in sentence (16), however, is not included in the 'birthday party' frame. The present experiment indicates that 'ga' marks the less predictable referent signifying a 'breakdown' from what a person knows or expects when a certain frame is introduced.

#### EXPERIMENT IV. THEMATIC IMPORTANCE

The sets of the experiments conducted in the previous study attempted to measure the degree of predictability in terms of previous discourse contexts. Experiment IV examines the relationship between 'thematic importance' and case marking usage. 'Thematic importance' is measured by the topical persistence of the referent in the subsequent discourse. This experiment examines the first mention reference and the cataphoric relation of that reference. Text (17) is designed so that the test word, 'book', appears repeatedly. Text (18) is designed so that the test word 'book' is mentioned only once. The subjects were instructed to read both texts and later to place the appropriate case markings in the test sentences.

Significant differences exist in each context. The entity that appears frequently in subsequent contexts is likely to be marked with 'ga', instead of 'o'

TABLE 6. Thematic Importance and Case Marking Usage

|           | 'ga'     | 'o'      | Total |
|-----------|----------|----------|-------|
| Text (17) | 21 (84%) | 4 (16%)  | 25    |
| Text (18) | 10 (40%) | 15 (60%) | 25    |

$$\chi^2 = 10.27, \quad df = 1, \quad p < 0.01$$

Recall that Givón correlates the frequency of mention with the importance of discourse. We assume, then, that a first mention entity that is taken as a most important component of the subsequent discourse serves to create a 'foregrounded frame' which signals to the reader to pay attention to that particular piece of information. By this, the paragraph's initial sentence has the effect of foregrounding various elements which are all introduced as new information. For instance, in the experiment IV texts, this new information includes such items as 'Taroo', 'movie', 'bookstore', and 'textbook'. All of these entities can then be regarded as foregrounded at the beginning of the sentence. Of these, 'book' is clearly brought to the foreground frame in text (17), whereas the occurrence of 'book' constitutes a rather subsidiary or subordinate element in text (18).

We might therefore assume that some entities newly registered in a discourse will later continue to participate explicitly in a speaker's foregrounded frame and will significantly affect the hearer's interpretation of future parts of the discourse. But other entities appear on the foregrounded frame only temporarily

and disappear after only a brief appearance. The use of 'ga' may thus be a reflection of the topic importance in the discourse, helping to distinguish between these two alternatives. That is, a speaker is likely to place the 'ga' on the entity that requires the hearer's constant attention throughout the course of his intended discourse.

## CONCLUSIONS

Some general conclusions can be attached to the results of the experiments. Experiment I examined the relationship between 'referential predictability' and case marking. The results indicate that there is no significant correlation between the use of 'ga' and previous mention of the referents. There is a significant correlation, however, between the use of 'ga' and the presence of interfering objects. Experiment II and III concern 'thematic predictability'. Both experiments were designed so that the first sets of each sentence (or context) are more predictable than the second sets. The results show that significant differences exist in the use of case marking when comparing the two sets. 'Ga' is likely to mark the referent that is less predictable at a given moment in a sentence (or discourse). Experiment IV examined 'thematic importance' of the referent measured in terms of its persistence in the subsequent context. The results strongly support the idea that 'ga' is used with thematically important referents that persist longer in the subsequent discourse.

The two discourse notions assessed in the present study, 'predictability' and 'thematic importance', are closely tied in with the psychological cognitive process of 'attention'. That is, what captures attention is the entity that is less predictable and more important at a given point in a discourse. It follows, then, that this entity requires perceptually more salient coding material. The case marker 'ga' codes the speaker's state of mind and enables a hearer to uniquely identify the referent. The set of discourse studies conducted for the present paper gives a new dimension to understanding the morphosyntactic structure in Japanese.

## APPENDIX

### EXPERIMENT I (English translation)

(8) Yesterday I went to the library to borrow the psychology book that is assigned for my psychology class. In the library, I ran into Yoshio. He said he was going to see a movie that night, so we decide to go to a movie together. Before going to the theater, we had a light supper at a restaurant, and we got to the theater on time. After we saw the movie, we went to a coffee shop to have a cup of coffee. We talked about the movie, and we had a nice time talking together. When I mentioned my psychology class, he said he wanted to read the book which I borrowed from the library, so I lent it to him.

(9) Yesterday I went to the library to borrow the psychology book that is assigned for my psychology class. while looking for the book, I met Yoshio. He said he was also going to borrow it, so we decided that I would borrow it first, and give it to him as soon as I finished reading it. When we were leaving, we ran across Mariko, and she said she also wanted to borrow the book. I told her that I was supposed to give it to Yoshio because he also wanted to read it.

(10) Yesterday I went to the library to borrow the psychology book that is assigned for my psychology class. while looking for the book, I met Yoshio. He said he was also going to borrow it, so we decided that he would borrow it first, and give it to me as soon as he finished reading it. When we were leaving, Yoshio found a math book which was recommended by a teacher. As soon as he found it, he said that he would let me read the psychology book first, because he wanted to read the math book.

#### EXPERIMENT II (English translation)

(11)a. When Taroo went to the Keio hospital, he told the doctor that he wanted to see his medical records."

b. When Taroo went to the hospital, he told a doctor that he wanted to read the Tale of Genji.

(12)a. Taroo said he wanted to buy rice at the rice shop.

b. Taroo said he wanted to buy rice at front of the station.

(13)a. A book lover would want as much money as he needs to buy a book.

b. A man would want as much money as he needs to buy a woman's heart.

(14)a. Since Mr. Smith has been studying Japanese 5 years, he can use the language fluently.

b. Wherever he goes, Mr. Smith can use Japanese fluently.

#### EXPERIMENT III (English translation)

I had a birthday party for my sister, Noriko, at my house last night. Noriko and I invited several friends for about 6 o'clock in the evening. I made a birthday cake, and some of our friends helped me cook for the party while Noriko was reading the textbook which had been assigned for her psychology class. People were coming around 6 o'clock with wine and a birthday present with a card. We sat down around the table, which was filled with food and pretty flowers. I served the cake and wine for Noriko first, but

(15) She told me that she wanted to read the birthday cards before eating.

(16) She told me that she wanted to read the textbook for another hour.

#### EXPERIMENT IV (English translation)

(17) Since Taroo said he wanted to buy a textbook, we went to the bookstore. The book he was looking for was the one that he uses for mathematics class. Tomorrow he has a quiz which will be given from the book. But unfortunately,

the book was already sold out, and he had to order the book. Since he needed it immediately, instead of buying it, he decided to go to the library and find that book, but he couldn't find it. Then finally he asked one of his friend in the class to lend him the book. He spent two hours to finally get the book. I told him that he should have bought it before it was sold out.

(18) Taroo and I were supposed to go to the movie tonight. Before going to the movie, he said he wanted to buy a textbook, so we went to the bookstore first. After he bought the book, he met a friend who is in the same class with him. And he started a chat with his friend. during the time, I was standing aside, but I became tired and irritated by the time they had been talking for fifty minutes. I finally asked Taroo if we could leave since the movie would start soon. But he said he wanted to cancel our date tonight since he wanted to drink beer with him. I was so mad that I could hardly talk. That night, he called me and apologized me, but I told him that we should not meet any more and hung up the phone.

#### FOOTNOTES

1. Hooper and Thompson (1980) suggest that transitivity is significant in the grammars of the world's languages. They indicate that no language has a strictly ergative-absolutive case marking system, nor a strictly nominative-accusative system. Rather there is a continuum of case marking. The lower the transitivity, the more likely the language is to have a split case marking system.
2. In some circumstances, the differential case markings on transitive objects can be explained on the basis of the semantic content of the predicate without appeal to discourse factors. (See Sugamoto 1982 and Shibatani 1982.)
3. Totals here refer not to the total number of subjects, but to the number of utterances independently obtained from the experiment.
4. Various semantic theories have been couched in the literature. For example, 'decompositional theory' is advocated by Kalz and Fodor, 1963. The notion of 'conceptual dependency' for semantic analysis is introduced by Schank 1972. Network theory is introduced by various scholars (Quillian 1968, Collins and Quillian 1972). However all the semantic theory which has conceived a meaning of a sentence as autonomous, independent from a wider discourse context in which it is incorporated, failed to make explicit some aspects of how a language user reaches the 'understanding' of a given sentence.

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